

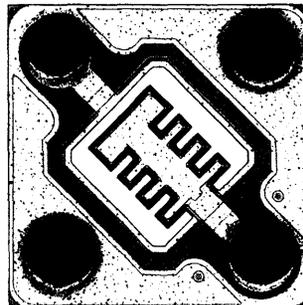
MMCF2221, MMCF2221A (SILICON) MMCF2222, MMCF2222A

FLIP-CHIP NPN SWITCH AND AMPLIFIER TRANSISTORS

Flip-Chip – General purpose NPN switching and amplifier transistor family similar to the 2N2221,A and 2N2222,A devices.

Primary Electrical Features:

- DC Current Gain specified for 0.1 to 300 mAdc
- Low Collector-Emitter Saturation Voltage –
- DC to VHF Amplifier Applications
- Complements to MMCF2906,A and MMCF2907, A



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MAXIMUM RATINGS

Rating	Symbol	MMCF2221 MMCF2222	MMCF2221A MMCF2222A	Unit
Collector-Emitter Voltage	V_{CEO}	30	40	Vdc
Collector-Base Voltage	V_{CB}	60	75	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current – Continuous	I_C	500		mAdc

MMCF2221, MMCF2221A, MMCF2222, MMCF2222A (continued)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I _C = 10 mAdc, I _B = 0)	BV _{CEO}	30 40	— —	Vdc
MMCF2221, MMCF2222 MMCF2221A, MMCF2222A				
Collector-Base Breakdown Voltage (I _C = 10 μAdc, I _E = 0)	BV _{CBO}	60 75	— —	Vdc
MMCF2221, MMCF2222 MMCF2221A, MMCF2222A				
Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	BV _{EBO}	5.0	—	Vdc
Collector Cutoff Current (V _{CB} = 50 Vdc, I _E = 0)	I _{CBO}	—	10	nAdc
Emitter Cutoff Current (V _{EB} = 3.0 Vdc, I _C = 0)	I _{EBO}	—	10	nAdc
ON CHARACTERISTICS				
DC Current Gain (I _C = 0.1 mAdc, V _{CE} = 10 Vdc)	h _{FE}	20 35	— —	—
MMCF2221,A MMCF2222,A				
(I _C = 1.0 mAdc, V _{CE} = 10 Vdc)		25 50	— —	
MMCF2221,A MMCF2222,A				
(I _C = 10 mAdc, V _{CE} = 10 Vdc)		35 75	— —	
MMCF2221,A MMCF2222,A				
(I _C = 150 mAdc, V _{CE} = 10 Vdc)(1)		40 100	150 300	
MMCF2221,A MMCF2222,A				
(I _C = 300 mAdc, V _{CE} = 10 Vdc)(1)		25 30 35 45	— — — —	
MMCF2221 MMCF2221A MMCF2222 MMCF2222A				
Collector-Emitter Saturation Voltage(1) (I _C = 150 mAdc, I _B = 15 mAdc)	V _{CE(sat)}	— —	0.5 0.4	Vdc
MMCF2221, MMCF2222 MMCF2221A, MMCF2222A				
Base-Emitter Saturation Voltage(1) (I _C = 150 mAdc, I _B = 15 mAdc)	V _{BE(sat)}	— —	2.0 1.5	Vdc
MMCF2221, MMCF2222 MMCF2221A, MMCF2222A				
DYNAMIC CHARACTERISTICS				
Current-Gain-Bandwidth Product (I _C = 20 mAdc, V _{CE} = 20 Vdc, f = 100 MHz)	f _T	250	—	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 100 kHz)	C _{ob}	—	12	pF

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

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